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IS 9780 (1992): Glass bottles for tomato ketchup [CHD 10: Glassware]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

टमाटर केच-अप के लिए काँच की बोतलों की विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

GLASS BOTTLES FOR TOMATO KETCHUP —
SPECIFICATION

(*First Revision*)

UDC 621.798.147 [666.171] : 664.871.6 : 635.64

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Glass Containers Sectional Committee, MCPD 13 (now a part of Glassware Sectional Committee) had been approved by the Chemical Division Council.

This standard was first published in 1981. The present revision incorporates certain modifications to bring this standard in line with the current manufacturing practices. As such, this revised standard provides for bottles with vacuum lug finish and with dual neck finish. It is felt that in the near future bottles with vacuum lug finish may be manufactured in the country.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GLASS BOTTLES FOR TOMATO KETCHUP — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This standard lays down requirements for glass bottles for packing of tomato ketchup.

2 REFERENCES

The following Indian Standards are the necessary adjuncts to this standard:

IS No.	Title
2303 : 1963	Method of grading glass for alkalinity
6654 : 1982	Glossary of terms relating to glass container (first revision)
6945 : 1973	Code of practice for packaging glass and glassware
7511 (Part 6) : 1986	Dimension for neck finishes: Part 6 Dual neck finish (first revision)
7511 (Part 8) : 1986	Dimensions for neck finishes: Part 8 Vacuum lug finish (first revision)
10497 : 1983	Method of test for the determination of brimful capacity of glass containers by gravimetric method
11930 : 1986	Methods of thermal shock tests for glass containers

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 6654 : 1982 shall apply.

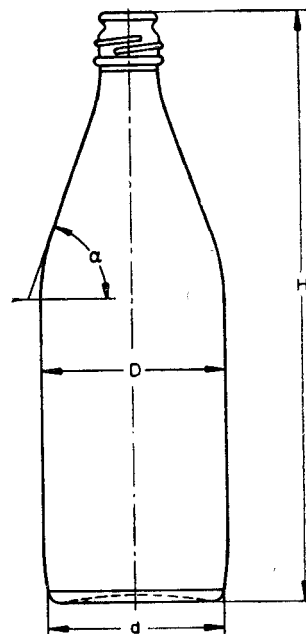
4 SHAPE AND DIMENSIONS

4.1 The shape of the bottle shall be as agreed to between the purchaser and the supplier. While specifying the shape of the bottle, the dimensional relationship as given in Fig. 1 shall be maintained. The design of the bottle shall be such that there is free flow of content when the bottle is tilted.

4.2 The wall thickness of the body of the bottle shall be 1.5 mm, *min*.

5 NECK FINISH

5.1 The ketchup bottles shall be provided with dual neck finish which is capable of taking a



Relationship	Brimful Capacity (C)	Limiting Value
Weight/ Capacity $\left[\frac{W^*}{C} \right]$	50 ml $\leq C \leq$ 180 ml	7.3 Min 12 Max
	180 ml $\leq C \leq$ 1 000 ml	4.9 Min 9.5 Max
Height/Dia $\left[\frac{H}{D} \right]$	50 ml $\leq C \leq$ 1 000 ml	2 to 4
Angle of Shoulder (α)	—	40° Min
Stability $\left[\frac{d}{H} \right]$	—	0.22 Min

*Weight of the bottle W to be taken in g;
Brimful capacity of the bottle C to be taken in centilitres.

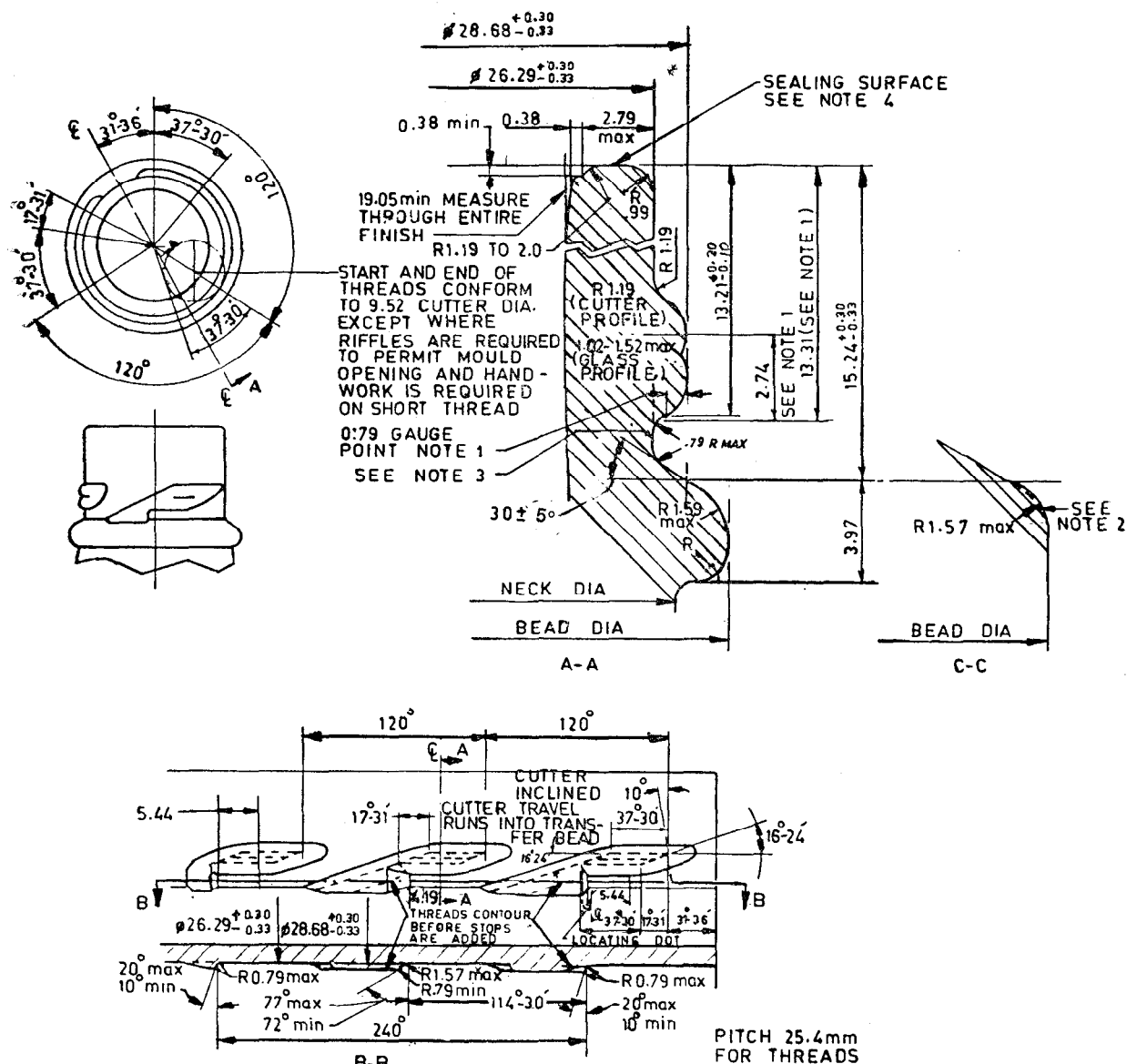
FIG. 1 DIMENSIONS OF BOTTLE

crown cork type closure and over it a screw thread conforming to IS 7511 (Part 6) : 1936 or shall have 30 mm vacuum lug finish meeting the dimensional requirements as given in IS 7511 (Part 8) : 1986. Figure 2 gives the dimensions for glass neck finish for 0.30 lug cap.

6 REQUIREMENTS

6.1 Material and Workmanship

The bottles shall be made of clear glass and shall have a smooth surface without cracks,

FIG. 2 DIMENSIONS FOR GLASS NECK FINISH FOR $\phi 30$ LUG CAP

sharp edges or bubbles. The bottles shall also be free from cords, blisters and stones, and as far as possible, free from loading marks as well.

6.1.1 The sealing surface shall be free from hairline cracks (split finish) and prominent seam marks.

6.1.2 The bottles shall be well formed with a uniform distribution of glass all over the walls and the base, avoiding any edge at the bottom.

6.1.3 Limit of Alkalinity

When graded according to the method prescribed in IS 2303 : 1963, the glass of the bottle shall conform to Type 4.

6.2 Annealing

The bottles shall be well annealed and shall not contain strains more than that shown by three standard strain discs.

6.3 Thermal Shock Resistance

The bottles when subjected to the thermal shock test according to IS 11930 : 1986 shall not show any visible cracks or damage after the test. The temperature difference ($t_1 - t_2$) for the thermal shock test shall be kept at 43°C, keeping the lower bath temperature (t_2) at room temperature.

6.4 Brimful Capacity

The brimful capacity of the bottles when checked at room temperature of $27 \pm 2^\circ\text{C}$ according to IS 10497 : 1983 shall be as given in Table 1.

Table 1 Brimful Capacity of Tomato Ketchup Bottles

Nominal Capacity	Brimful Capacity	Net Contents of Tomato Ketchup	Mass of Bottles
ml	ml	g	g
500	515 ± 7	500	385 ± 14
1 000	$1\ 020 \pm 10$	1 000	510 ± 25

6.5 Dimensional Tolerances

The dimensional tolerances shall be calculated by the formulae given in 6.5.1 and 6.5.2. The individual values of the tolerances resulting from the following formulae shall be rounded to 0.1 mm.

6.5.1 Tolerance on height 'H' when measured by the fixture shown in Fig. 3 shall not exceed the limits calculated by the following formulae:

$$T_H = \pm (0.6 + 0.004 H)$$

6.5.2 Tolerance on diameter (ovality included)

$$T_D = \pm (0.5 + 0.012 D)$$

6.5.3 Tolerance on Verticality

The shape of the bottle shall be such that when kept on a flat surface the sealing surface shall be parallel to the base. A vertical line through the centre of the circle formed by the inside neck opening shall pass through the centre of the circle described by the bottom resting surface. The maximum permissible variation in verticality when tested according to the method given in Annex A shall be 1.5 mm.

7 PACKING AND MARKING

7.1 Packing

The bottles shall be packed in accordance with the guidelines given in IS 6945 : 1973.

7.2 Marking

Each bottle shall be marked permanently and legibly on its surface with the following:

- its nominal capacity followed by the letter 'ml' on the side,
- indication of the source of manufacture at the bottom.

8 SAMPLING

8.1 Representative samples of the bottles shall be drawn and adjudged for conformity to this standard as prescribed in Annex B.

ANNEX A (Clause 6.5.3)

TEST FOR VERTICALITY OF BOTTLES

A-1 GENERAL

A-1.1 This test determines the combined effect of the offset of mouth with the body and the mouth being at an angle to the body.

A-2 ASSEMBLY

A-2.1 Assembly for the determination of verticality of bottle shall be as shown in Fig. 3.

A-3 PROCEDURE

A-3.1 Fill the bottle with water in order to give it more stability and place it on its base on the

flat plate having a shaft bolted to it at right angle. Adjust the V-block mounted on the shaft in such a manner that it is in contact with the outer diameter of the bottle at about the middle. Adjust one of the dial indicators fitted to the shaft so that its measuring point comes in contact with the outer edge of the neck of the bottle and that of the second on the top of the sealing surface for measuring the height of the bottle. Rotate the bottles, keeping the body always in contact with the V-block. Note down the maximum deflection on the indicator.

A-3.1.1 Half of the total deflection shown by the indicator shall be the variation in verticality.

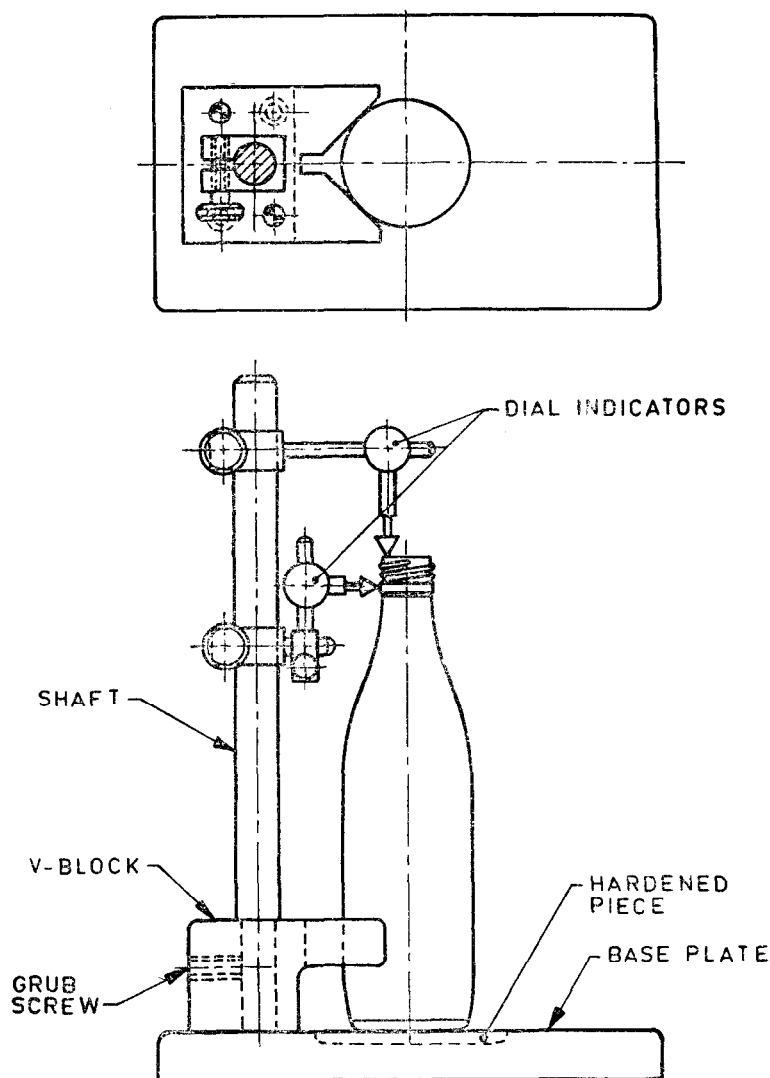


FIG. 3 ASSEMBLY FOR TESTING VERTICALITY AND HEIGHT

ANNEX B

(Clause 8.1)

SAMPLING OF GLASS BOTTLES

B-1 SCALE OF SAMPLING

B-1.1 Lot

In any consignment all the glass bottles of the same dimensions and manufactured under the same conditions, shall be grouped together to constitute a lot.

B-1.2 Samples shall be tested from each lot for ascertaining the conformity of the bottles to the requirements of this specification.

B-1.3 The number of glass bottles to be selected in the sample depends on the size of the lot and

shall be in accordance with col 1 and 3 of Table 2.

B-1.4 If the glass bottles are packed in a number of cartons at least 30 percent of the cartons, subject to a minimum of 2 cartons, shall be opened for selecting the samples.

B-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-2.1 Visual and Dimensional Requirements

Test for the visual and dimensional requirements (4.1, 6.1 and 6.5), excluding, alkalinity

test for ascertaining the conformity of the test shall be made on sample containers selected in one or two stages as the case may be (see Table 2).

B-2.1.1 The sample bottles selected in the first stage shall be examined for various requirements specified under 4.1, 6.1 and 6.5. Any bottle failing to satisfy one or more of these requirements shall be termed as defective. If the number of defectives in the first stage is less than or equal to the acceptance number (a) given in col 5 of Table 2, the lot shall be accepted. If the number of defectives is equal to or greater than the rejection number (r) given in col 6 of Table 2 the lot shall be rejected. If it lies between (a) and (r) for the first stage, a second sample of size given in col 3 of Table 2 shall be taken. If the cumulative no. of defectives is less than or equal to the acceptance

numbers for the second stage, the lot shall be deemed to have satisfied these requirements. However, if the cumulative number of defectives is equal to or greater than the corresponding rejection number, the lot shall be rejected without further testing.

B-2.2 Alkalinity and Thermal Shock Resistance Tests

The lot having been found satisfactory according to clause B-2.1 shall be further subjected to these tests. One test shall be conducted for determining alkalinity of the class. For thermal shock resistance test, the samples shall be drawn as per Col 7 of Table 2. The samples for both these tests shall be taken from those already examined and found satisfactory as per B-1.4. The lot shall be declared as conforming to the requirements of this specification, if there is no failure in either of these tests, otherwise not.

Table 2 Scale of Sampling and Criteria for Conformity

Lot Size	Stage of Sample	Sample Size	Cumulative Sample Size	Acceptance No. (a)	Rejection No. (r)	Sample Size for Thermal Shock Resistance
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Up to 50	First stage	8	8	0	2	1
	Second stage	8	16	1	2	
51 „ 100	First stage	13	13	0	3	3
	Second stage	13	26	3	4	
101 „ 300	First stage	20	20	1	4	5
	Second stage	20	40	4	5	
301 „ 500	First stage	32	32	2	5	7
	Second stage	32	64	6	7	
501 and above	First stage	50	50	3	7	10
	Second stage	50	100	8	9	

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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AMENDMENT NO. 1 NOVEMBER 2005
TO
IS 9780 : 1992 GLASS BOTTLES FOR TOMATO
KETCHUP — SPECIFICATION

(First Revision)

(Page 1, clause 2) — Substitute the following for the existing clause:

‘2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below :

<i>IS No.</i>	<i>Title</i>
2303 (Part 1/ Sec 1) : 1994	Grading glass for alkalinity : Part 1 Hydrolytic resistance, Section 1 Hydrolytic resistance of glass grains at 98°C — Method of test and classification (<i>first revision</i>)
6654 : 1992	Glass containers — Glossary of terms (<i>second revision</i>)
6945 : 1973	Code of practice for packaging glass and glassware
7511 (Part 6) : 1986	Dimensions for neck finishes : Part 6 Dual neck finish (<i>first revision</i>)
7511 (Part 8) : 1986	Dimensions for neck finishes : Part 8 Vacuum lug finish (<i>first revision</i>)
10497 : 1983	Method of test for the determination of brimful capacity of glass containers by gravimetric method
11930 : 1986	Methods of thermal shock tests for glass containers’

(Page 1, clause 3.1, second line) — Substitute ‘IS 6654’ for ‘IS 6654 : 1982’.

(Page 2, clause 6.1.3) — Substitute the following for the existing clause:

‘6.1.3 Limit of Alkalinity

The glass of the bottles shall conform to Class HGB 3 of the glass when graded according to the method prescribed in IS 2303 (Part 1/ Sec 1).’

(Page 3, clause 6.5.3) — Insert the following at the end:

‘6.6 Bottle Washing

All bottles shall be thoroughly cleaned immediately before filling by automatic/semi-automatic washing machines. Washing shall be accomplished by prerinse and final rinse. For final rinse dechlorinated potable water shall be used. Bottles should be thoroughly drained, sterilized and dried after final rinse so that strength and purity of content is not affected after filling. Water jets in the washing machine should be so designed and jet pressure so maintained as to thoroughly rinse the whole internal and external surface area of the bottles. Wash water in the bottle washer should be thoroughly drained and changed frequently to prevent algal growth.

6.6.1 Wherever second hand bottles are being used, all the bottles should be pre-washed prior to feeding to the bottle washer. This should be done in the following manner:

- a) Pre-rinse first soaking in a tank to remove labels and other extraneous matter.
- b) Rinse in the second tank with hot water around 60°C and 3 percent caustic solution at 60°C using brushes to clean the interior and exterior of bottles thoroughly.
- c) Final rinse in the third tank with potable water.
- d) Feed the bottles to bottle washer.’

(CHD 10)